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November 3, 2017

Mark Manfredi
Red Hill Regional Program Director
850 Ticonderoga St, Suite 110
Joint Base Pearl Harbor- Hickam, Hawai'i 96860

Subject: Regulatory Agency Comments on Recently Submitted Derivative Deliverables
under AOC Sections 6 & 7

Dear Mr. Manfredi:

The U.S. Environmental Protection Agency ("EPA") and Hawaii Department of Health ("DOH"), collectively the "Regulatory Agencies", have reviewed the following four derivative deliverables:

1. "Conceptual Site Model Development and Update Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation" Submitted September 1, 2017
2. "Sampling and Analysis Plan Addendum No. 1" Submitted September 1, 2017
3. "Attenuation Evaluation Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation" Submitted September 1, 2017
4. "Monitoring Well Installation Work Plan Addendum 02" Submitted August 25th, 2017

These products are not considered deliverables pursuant to Administrative Order on Consent (AOC), and do not require formal "approval". The comments of the Regulatory Agencies are attached and reflect a collection of professional opinions. Overall, we believe that the accelerated effort to obtain data and install new monitoring wells is positive, and we are encouraged to see an accelerated pace on the environmental investigation and assessment efforts.

The Navy and Defense Logistics Agency have devoted a significant amount of resources to develop and execute these plans. The Regulatory Agencies believe this additional work is necessary in order to improve the reliability of the conceptual site and groundwater flow models, though it will be a challenge to collect all necessary data given the relatively short timeframe remaining for completing the groundwater flow model report. In addition to the new information

that will be obtained from implementing these plans, the Regulatory Agencies believe that existing data will add value as it is analyzed and incorporated into the model, as it will demonstrate that the model can reliably account for historic data.

Sincerely,

Robert Pallarino

Bob Pallarino,
U.S. EPA Region IX

Steven Chang,
Hawaii Department of Health

Enclosure

cc: Cory Waki, US Navy

Regulatory Agencies comments on Navy Derivative Deliverables.

Conceptual Site Model (CSM) Development Plan

The CSM Development Plan does not discuss uncertainty. In previous discussions with the Navy, the Regulatory Agencies had stressed the importance of developing a hypothesis, providing backup data to support the hypothesis, and discussing uncertainty with respect to the Navy's future conclusion.

For example, preferential pathways such as lava tubes or fractured bedrock are an important uncertainty to acknowledge as unmapped fractures, lava tubes, and clinker zones could cause contamination and light non-aqueous phase liquid (LNAPL) to migrate in unexpected ways. The Regulatory Agencies understand that it is difficult to accurately map these preferential pathways, therefore the uncertainty they add to the modeling process can be significant.

Monitoring Well Installation Workplan (MWIWP) Addendum 2

Page 2-1; Lines 31-37 and Page 2-3; Table 2-1

The one-inch casing used in the existing RHMW01 results in very slow sample pump flow rates that require an extended period of time to collect adequate sample volume. Also, the solid casing in this well extends beneath the water table preventing the detection of LNAPL should it be present on the water table at the location of RHMW01. The Navy currently collects monthly oil/water interface measurements from the existing RHMW01 to check for the presence of LNAPL, though the depth of the casing makes this measurement of questionable value. The new monitoring well, RHMW01R will resolve the sample collection time issue. The proposal to install the Westbay system in order to collect groundwater samples at various depths will provide useful information however it will prevent the Navy from using the oil/water interface probe it has historically used to check for the presence of LNAPL. The Navy has stated that the presence of LNAPL on the water table can be inferred by whether there is a sheen on water purged from the well and the concentrations of chemicals of potential concern. However, neither the MWIWP nor the Sampling and Analysis Plans and Addendums indicate the frequency of checking for the presence of LNAPL in the new RHMW01R and whether the Navy intends to continue collecting monthly data on the presence of LNAPL at this location.

Page 2-3; Table 2-1, RHMW07D

The Regulatory Agencies believe that the purpose and rationale of the new RHMW07D requires additional explanation as to the possible causes of the water table elevation anomaly and where the replacement well will be located to ensure that the groundwater encountered in the new well does not suffer from the same problems as the existing well. A suggestion is to delay installation of RHMW07D and revisit its location installation after testing of RHMW11. Information from this well could help fine tune the location of RHMW07D.

Page 2-9; Table 2-2

Some of the estimated surface elevations seem to be in error. For example, the ground elevation at RHMW16 appears to more than 500 ft. rather than 260 ft. as stated in table 2-2.

Page 2-10; Section 2.3 Installation of RHMW01R

The Navy should consider evaluating the vadose zone for past occurrences of perched water (i.e. zones of weathered rock or rock with mineral deposits on the surface). Isolating such a zone with packers and installation of a sampling port may prove useful in evaluating movement of water and contamination in the vadose zone during periods of heavy rain or during a fuel release. Past cores from the tunnel wells have shown evidence consistent with transitory perched water as have some of the soil vapor monitoring probes.

Page 3-4; Lines 3-12

As stated in previous reviews of the MWIWP, perched water will almost certainly be encountered in some of the boreholes. This includes RHMW11, RHMW07D, RHMW12, RHMW13 due to their proximity to the stream or areas where perched water has been found previously. Thus, it is critical that the tests for perched water be frequent since perched water zones could be drilled through quickly. See other comments below on this subject. A more comprehensive check for perched water is stated in Appendix C, Page C-7, Lines 2-8 and should also be included in this section or appropriately referenced.